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खंड 2 क्वाट्र्ज भरित एपॉक्सी रेजिनी यौगिक

(पहला पुनरीक्षण)

Indian Standard

RESIN BASED REACTIVE COMPOUNDS USED FOR ELECTRICAL INSULATION

PART 3 SPECIFICATIONS FOR INDIVIDUAL MATERIALS

Section 2 Quartz Filled Epoxy Resinous Compounds

(First Revision)

ICS 29.035.01

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NEW DELHI 110002

April 2006

Price Group 1

Solid Electrical Insulating Materials and Insulation Systems Sectional Committee, ET 02

NATIONAL FOREWORD

This Indian Standard (Part 3/Sec 2) (First Revision) which is identical with IEC 60455-3-2 (2003) 'Resin based reactive compounds used for electrical insulation — Part 3 : Specifications for individual materials — Sheet 2 : Quartz filled epoxy resinous compounds' issued by the International Electrotechnical Commission (IEC) was adopted by the Bureau of Indian Standards on the recommendation of the Solid Electrical Insulating Materials and Insulation Systems Sectional Committee and approval of the Electrotechnical Division Council.

This part of IEC 60455 is one of the series which deals with specifications for resin based reactive compounds used for electrical insulation. This series consists of the following other parts:

Part 1 Definitions and general requirements
Part 2 Methods of test

This standard has been revised to align with the latest IEC Standard.

The text of the IEC Standard has been approved as suitable for publication as an Indian Standard without deviations. Certain conventions are, however, not identical to those used in Indian Standards. Attention is particularly drawn to the following:

a) Wherever the words 'International Standard' appear referring to this standard, they should be read as 'Indian Standard'.
b) Comma (,) has been used as a decimal marker while in Indian Standards, the current practice is to use a point (.) as the decimal marker.

In this adopted standard, reference appears to the following International Standard for which Indian Standard also exists. The corresponding Indian Standard which is to be substituted in its place is listed below along with its degree of equivalence for the edition indicated:

International Standard	*Corresponding Indian Standard*	*Degree of Equivalence*
IEC 60455-2 (1988) Resin based reactive compounds used for electrical insulation — Part 2 : Methods of test	IS 13465 (Part 2) : (2004) Resin based reactive compounds used for electrical insulation: Part 2 Methods of test (*first revision*)	Identical

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

RESIN BASED REACTIVE COMPOUNDS USED FOR ELECTRICAL INSULATION

PART 3 SPECIFICATIONS FOR INDIVIDUAL MATERIALS

Section 2 Quartz Filled Epoxy Resinous Compounds

(First Revision)

1 Scope

This part of IEC 60455 contains the requirements for quartz filled epoxy resinous compounds in the cured form for types EP-F-1 to EP-F-7. Other materials than quartz may be introduced later.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60455-2:1998, *Resin-based reactive compounds used for electrical insulation – Part 2: Methods of test*

3 Requirements

The requirements for quartz filled epoxy resinous compounds in the cured form are given in Table 2. If not otherwise specified, the requirements are for (23 ± 2) °C.

NOTE 1 Materials with fillers different from quartz may be added as additional tables.

Quartz filled epoxy resinous compounds purporting to comply with this standard shall contain between 45 % and 65 % by mass of quartz filler.

NOTE 2 Materials for use in lower or higher temperature conditions may require additional tests to establish their suitability.

4 Special requirements

When any of the following special properties are prescribed in the purchase contract, the method of test given below shall be used.

Table 1 – Requirements for quartz filled epoxy compounds in the uncured form

Property	Method of test in IEC 60455-2 Subclause
Viscosity	5.3
Epoxy equivalent	5.9
Shelf life	5.4
Pot life	5.16
Exothermic temperature peak	5.18.2
Total shrinkage	5.19

Table 2 – Requirements for quartz filled epoxy compounds in the cured form

Properties		Method of test according to IEC 60455-2 Subclause	Unit	Value	Requirements for compounds types EP-F-1	EP-F-2	EP-F-3	EP-F-4	EP-F-5	EP-F-6	EP-F-7
Density		5.2	g/cm^3	Range	1,7 – 1,9						
Flexural (3 points) strength at rupture		6.3.3	MPa	Min.	60	80	90	110	90	60	Typical values under consideration
Tensile strength at rupture		6.3.1	MPa	Min.	40	50				30	
Impact strength, unnotched, flatwise		6.3.4	kJ/m^2	Min.	3	4	6	7	8	8	
Glass transition temperature			°C		*Typical values under consideration*						
Temperature of deflection under load		6.4.4.2	°C	Min.	160	135	125	100	75	45	
Flammability		6.4.5			FH2						
Water absorption		6.5.1 (method 1)	%	Max.	0,3	0,3	0,3	0,3	0,4	1,5	
Volume resistivity (no water immersion)		6.6.1	Ω·cm	Min.	1 × 10^{14}						
Dissipation factor	23 °C, 48 Hz to 62 Hz	6.6.2		Max.	0,02						
	23 °C, 1 MHz			Max.	0,35						
	Temperature [a], 48 Hz to 62 Hz			Max.	0,20						
Permittivity	23 °C, 48 Hz to 62 Hz	6.6.2		Max.	5						
	Temperature [a], 48 Hz to 62 Hz			Max.	6						
Electric strength [b]		6.6.3	kV/mm	Min.	10						
Tracking resistance		6.6.4		Min.	400					300	Typical values under consideration
Thermal endurance by flexural strength to 50 % of initial value [c]		6.4.7		Min.	140	130	130	120	105	90	
Thermal endurance by loss of mass		6.4.7			Typical values under consideration						

[a] The temperatures for determining dissipation factor and permittivity are as follows: EP-F-1: 160 °C, EP-F-2: 135 °C, EP-F-3: 125 °C, EP-F-4: 100 °C, EP-F-5: 75 °C, EP-F-6: 45 °C.

[b] The specimen shall be 3 mm thick and of sufficient area to prevent flashover.

[c] The value indicated for the temperature indices are minimum values which can therefore be considerably exceeded and should not be considered as characterizing the category or as being related to the temperature of deflection under load.

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This Indian Standard has been developed from Doc : No. ET 02 (5588).

Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

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Printed at Prabhat Offset Press, New Delhi-2